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10/725,436	12/03/2003	Kenji Nemoto	04208.0196	5335

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EXAMINER
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ENGLUND, TERRY LEE

ART UNIT	PAPER NUMBER
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2816

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/725,436

Applicant(s)

NEMOTO, KENJI

Examiner

Terry L. Englund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-11 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on Jun 9, 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment/Drawings***

The amendment and drawings submitted on Jun 9, 2005 were reviewed and considered with the following results:

The changes shown on the replacement sheets of Figs 3 and 6 have been approved, and the previous Office Action's drawing objection have now all been withdrawn.

The amended changes to the disclosure have overcome the various objections described in the previous Office Action. Therefore, those objections to the disclosure have now been withdrawn.

Although the objection to claim 7, line 11 was addressed satisfactorily, that objection was the only one described in the previous Office Action that has been completely withdrawn. The other objections were either not addressed/corrected, or not done so satisfactorily. For example, amended claim 4 did not address the redundant type phrasing; amended claim 5 did not address the "n-th the group" satisfactorily; and the objection to claims 9 (line 11), 10 (line 7), and 11 (lines 12, 24, and 34) were not addressed by the amended claims. Therefore, modified objections related to the claims described above are described later under the appropriate section, as well as additional objections found when the amended claims were reconsidered. [The previous Office Action's objections may have been modified in some cases to correspond to new line numbers within the amended claims.]

The amended claims satisfactorily overcame the following rejections under 35 U.S.C. 112 described in the previous Office Action: The rejections described completely on page 6 of the Office Action; and claims 4 (lines 26-27), 7 (lines 23-24), and 10 (line 5) described on page

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7. Therefore, these rejections have all been withdrawn. However, although the other amended changes may have overcome at least some of the other rejections under 35 U.S.C. 112 described on pages 7-8 of the previous Office Action, the changes either did not satisfactorily overcome the rejection(s), and/or they created new problems. All the other known rejections are described later under the appropriate section, wherein these include modified rejections with respect to amended sections of the claims and rejections described in the previous Office Action, and new rejections created by some of the amended claims. For example, amended claims 4-11 created new 35 U.S.C. 112 type rejections, which are described later under the appropriate section.

The amended claims overcame the rejections of claims 1-3, and 7-8 under 35 U.S.C. 102(b) with respect to the applicant's own Prior Art (e.g. Figs. 5 or 6); and of claims 1-3 under 35 U.S.C. 102(e) with respect to Coady. Therefore, all those prior art rejections have been withdrawn. The constant voltage provided by each of those circuits is not independent of the number of transistors, as now claimed, since the voltage actually depends on the number of them.

After reconsidering the newly added claim limitations, and performing an update search, claims 1-3 are rejected again with respect to a prior art reference. These rejections are described later under the appropriate section.

### ***Claim Objections***

Claims 4-6, and 8-10 are objected to because of the following informalities: Claim 4, lines 8-9 and 11 have the redundant phrase "a collector of each of the plurality of second pnp transistors being ground," wherein it is suggested one of those redundant phrases be deleted. To improve word flow, it is suggested the following changes also be made within claim 4: 1) line 13 change "an another" to --another--; 2) line 17 change "a emitter" to --an emitter--; and 3) line 20

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change “of the of” to --of the--. For reasons similar to claim 4 above, it is suggested the following changes be made within claim 5: 1) although “a one” on lines 4 and 11 could be changed to just recite --one--, the related phrasing can still cause problems (e.g. see the rejection of claim 4 under 35 U.S.C 111); 2) line 13 should have “an another” changed to --another--; and 3) “n-th one the” should be changed to --n-th one of the--. To improve word flow, and help ensure consistency throughout the claim, it is suggested “of the first npn transistor” on lines 9-10 of claim 8 be changed to --of first npn transistors-- (e.g. see the numerous occurrences of “plurality of first npn transistors” on lines 2-7). Claim 9, lines 7-8 should have “a first and second current” changed to --first and second currents--; and line 9 should have “a” deleted to more clearly relate to the plural use of “terminals.” Both of these changes will improve word flow within claim 9. Line 6 of claim 10 should have “a” deleted for the same reasoning as applied to line 9 of claim 9 described above. Claim 11 should have “a” deleted from the phrase “a first and second” recited on both lines 5 and 10; the singular “transistor” on lines 9, 19, and 27 should be made plural to be consistent with other related phrases; and “a” should be deleted from the phrase “a one” on lines 20 and 28-29.

Dependent claims carry over any objection(s) from any claim(s) upon which they depend.

Appropriate corrections are required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7-8, and 10-11 are now rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a constant voltage generating circuit that provides a constant output substantially independent of the number of first/second bipolar transistors, does not reasonably provide enablement for such a circuit wherein a connection point between two resistors is connected to the first input terminal of a current control means. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The circuit structures recited within claims 7 and 8 correspond to the applicant's own Prior Art Figs. 5 and 6, respectively. When viewing those figures, one of ordinary skill in the art would recognize that a first connection point of two resistors R2,R1 is connected to second input terminal + of current control means/differential amplifier OP1, constant voltage VOUT is provided at a second connection point of two resistors R2,R1, and that VOUT will actually depend on the number of at least the second bipolar transistors (i.e. PNP transistors PN11-PN1n shown in Fig. 5; and NPN transistors NP11-NP1n shown in Fig. 6). For example, where does the applicant's original disclosure/figures actually disclose or show the constant voltage generating circuit as now recited within each of claims 7 and 8? Claims 10-11 carry over the rejections of claims 7 and 8.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, and 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are how the differential voltage generating means

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(and/or differential amplifier) relates to any of the other elements (e.g. transistors, current sources, and current control means) already recited within either of claims 4 and 5, or claims 7 and 8. For example, how does “a differential amplifier” of claim 10 relate to the “differential amplifier” that is apparently within the current control means of each of claims 7 and 8 already? Related to this confusion, how do the “first and second input terminals” of the differential pair within claim 10 relate to the first and second input terminals of the current control means recited within each of claims 7 and 8?

Claims 4-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. With the deletion of “first of the” from line 4 of claim 4, it is no longer clear which one of the plurality of first pnp transistors can have its base ground. For example, can it be any one of the first pnp transistors? Therefore, it is suggested “a one of the” on line 4 be changed to --a first one of the-- to minimize confusion. Claims 5 (lines 4 and 11), 7 (lines 4 and 10), 8 (lines 4 and 11), and 11 (lines 20 and 28-29) have the same type of “a one” problem as described above with respect to claim 4, line 4. Therefore, the same type of corrective action (e.g. change “a one” to --a first one--) is suggested to minimize possible confusion by more clearly identifying a specific transistor within the plurality of transistors. It is not understood how the “first and second current sources”, now recited within claims 9 and 11, relate to any of the circuits shown within the applicant’s figures. For example, if P1 and P2 of Fig. 2 are considered the first/second current sources, they are coupled to the collectors of npn transistors NP11 and NP21, not to their emitters. Although an unlabeled current source is shown coupled to the emitters of npn transistors NP11 and NP21 through NP12-NP1m and NP22-NP2m,

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respectively, it is only a single current source. Also, can the “first and second current sources” of either claim 9 or 11 be associated with the “current sources” or “current source” already recited within their corresponding claim 4, 5, 7, or 8? It is not clear how first and second current sources supply a single current as line 5 of claim 11 now appears to imply. The connections of the npn transistors to “said current source” in claim 11, lines 13-15 are confusing for two reasons. First, how do these first/second npn transistors relate to the first/second npn transistors of the differential pair, and to the first/second pluralities of first/second npn transistors? Also, how does the singular “said current source” relate to the “first and second current sources” now recited on line 5 of claim 11? The use of “first npn transistor” and “second npn transistor” on lines 10-15 within claim 11 is confusing. For example, unless the transistors are consistently identified (e.g. --the first npn transistor of the differential pair--), it is not clear which “first npn transistor” is being referred to in claim 11 since the circuit of claim 8 already comprises its own plurality of first npn transistors, and claim 11 has first npn transistors within a second plurality of first npn transistors. Related to this confusion, how does “said pluralities of first npn transistors” on lines 17-18, and “said pluralities of second npn transistors” on lines 25-26, of claim 11 relate to the pluralities of npn transistors recited within each of claims 8 and 11? For example, the present phrasing appears to include the pluralities from claim 8, as well as the second pluralities recited within claim 11. Therefore, corrections and/or clarifications are requested.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person



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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris, a reference found and considered during the recent update search. Fig. 1B shows a constant voltage generating circuit comprising a plurality of  $n$  first bipolar transistors (not labeled but they are the two bipolar transistors shown on the left side of the circuit), wherein  $n = 2$  in this case; a plurality of  $n$  second bipolar transistors (not labeled but one of the transistors has its emitter coupled to resistor R2); a differential voltage generating means (not labeled but known to be a comparator/differential amplifier) for generating a differential voltage corresponding to the sums of the base emitter voltages of the first/second bipolar transistors applied to the first/second input terminals of the differential voltage generating means; voltage amplification adding means (e.g. the unlabeled MOS transistors, resistors R1 and R2, and the right most bipolar transistor) for amplifying the differential voltage and adding it to the base emitter voltage of one of the second bipolar transistors, and for providing a constant voltage out. The amplified voltage added to the base emitter voltage corresponds to the voltage drop across resistor R2 that is added to the voltage already on the emitter of the one second bipolar transistor. Constant voltage VBG is output, and is independent of temperature (e.g. see column 1, lines 47-48), and since it is provided across resistor R1 and its corresponding single bipolar transistor, the constant voltage is also independent of the number of first/second bipolar transistors within the pluralities. However, the reference does not clearly show or disclose that the bipolar transistors have different emitter areas. Harris discloses (e.g. see column 6, lines 51-55) that the emitter area of transistor Q2 (shown in Fig. 1A) is eight times greater than the emitter area of transistor Q1 (also shown in Fig. 1A, a related bandgap voltage circuit). Therefore, one of ordinary skill in the art.

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would understand that the transistors coupled to resistor R2 in Fig. 1B correspond to Q2 of Fig. 1A, and it would have been obvious to one of ordinary skill in the art that the second bipolar transistors (coupled to resistor R2 in Fig 1B) would each have a corresponding emitter area larger than the emitter area of the first bipolar transistors, rendering claim 1 obvious. The proper scaling of the emitter areas would provide a means for helping to ensure the final output voltage is temperature independent, resulting from a corresponding voltage difference detected at the input of the differential voltage generating means. Since differential voltage generating means includes a differential amplifier (clearly shown, but not labeled), which will inherently have an offset voltage, and the configuration is understood to have primary temperature characteristics at the input of the differential amplifier (e.g. see a corresponding description of Fig. 1A on column 1, lines 31-36), claim 2 is also rendered obvious. Independent claim 3 corresponds to the limitations recited within claim 2, which include the limitations already recited within claim 1. Therefore, claim 3 is rendered obvious for the same reasoning as applied to the combination of claims 1 and 2.

No claim is allowable as presently written.

***Allowable Subject Matter***

However, claims 4 and 5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. There is presently no motivation to modify or combine any prior art reference(s) to ensure the constant voltage generating circuit includes the specific relationships between the two resistors, the first one of the plurality second pnp transistors, and the another one of the plurality of second pnp

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transistors (e.g. see R1, R2, PN11, and PN12 of the applicant's own Fig. 1 (corresponding to the claim 4 limitations) or Fig. 3 (corresponding to the claim 5 limitations)).

Also, claims 6 and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Each of claims 6 and 9 depend on "claim 4 or 5", which have allowable subject matter as described above.

Although the previous Office Action had indicated claims 10 and 11 would also be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, that has now been withdrawn since claims 10 and 11 depend on either claim 7 or 8, wherein those claims are now rejected under 35 U.S.C. 112, first paragraph. Therefore, those first paragraph rejections must be first overcome before claims 10 and 11 can be made allowable.

### ***Response to Arguments***

The applicant's arguments, filed Jun 9, 2005, with respect to the rejection(s) of claim(s) 1-3 and 7-8 under 35 U.S.C. 102(b) and/or 102(e) have been fully considered and are persuasive because each of the prior art references, cited within the previous Office Action's prior art rejections, provide a constant voltage dependent on the number of first/second bipolar transistors. Therefore, those rejections described in the previous Office Action have been withdrawn. However, upon further consideration of the claimed invention, a new ground(s) of rejection is made in view of the newly added "independent of the number" related limitation.

Those rejections are described above, and are deemed proper with respect to the broadest reasonable interpretation of the claimed limitations and prior art reference(s).

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**THIS ACTION IS MADE FINAL.** The applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (571) 272-1740.

The new central official fax number is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

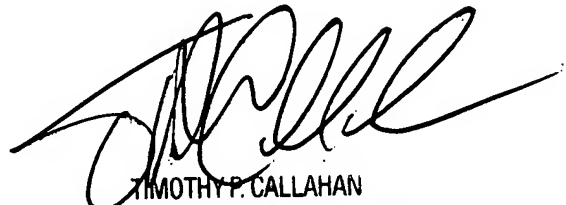
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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TLE

Terry L. Englund

15 October 2005



TIMOTHY P. CALLAHAN  
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